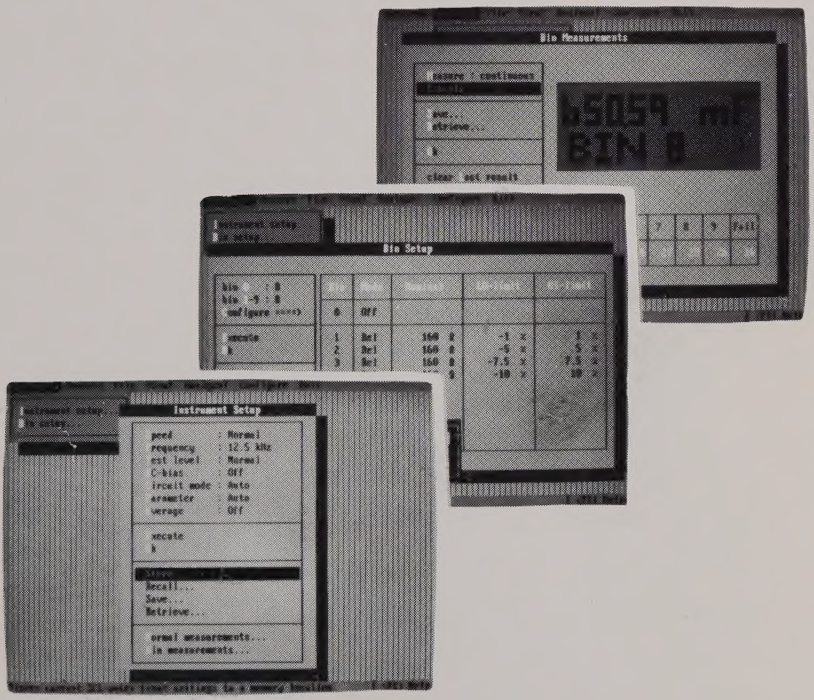
PM 2272
INSPECTOR

User Manual

4822 872 10001
940401



PHILIPS

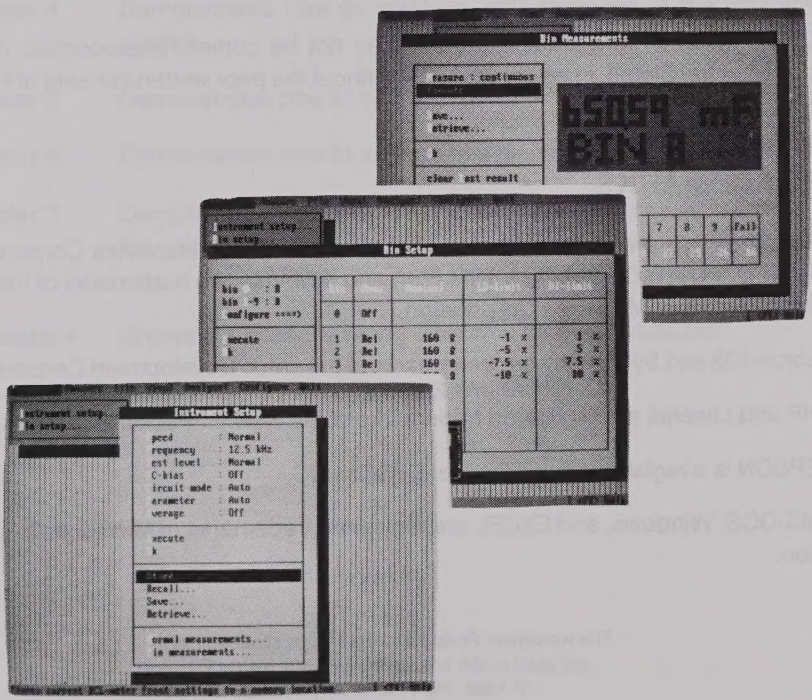
Digitized by the Internet Archive
in 2026

https://archive.org/details/manualsplus_12432

PM 2272
INSPECTOR

User Manual

4822 872 10001
940401



IMPORTANT NOTICE

The material in this manual is subjected to change without notice. Fluke assumes no responsibility for errors which may appear in the manual. Fluke makes no commitment to update, nor to keep current, the information contained in this manual.

COPYRIGHT

Under the copyright laws, this book may not be copied, photocopied, reproduced or translated, in whole or in part, without the prior written consent of FLuke Mfg. Co., Inc.

TRADEMARKS

IBM is a registered trademark of International Business Machines Corporation. IBM PC, PC AT/XT, IBM CGA, IBM EGA and IBM VGA are trademarks of International Business Machines Corporation.

Lotus-123 and Symphony are trademarks of the Lotus Development Corporation.

HP and Laserjet are registered trademarks of the Hewlett-Packard Company.

EPSON is a registered trademark of EPSON INC.

MS-DOS, Windows, and EXCEL are registered trademarks of Microsoft Corporation.

The wordmark Philips and the Philips shieldemblem
are used under licence from Philips Export B.V.
© 1993, 1994 Fluke Corporation.
All rights reserved.
Data subject to change without notice
Printed in Germany

FLUKE®

INSIDE THIS MANUAL

Chapter 1 Introduction

Chapter 2 Installation and setting up.

Chapter 3 Demonstrates how the Inspector program can be used to set up the RCL meter.

Chapter 4 Demonstrates how to measure with Inspector in the different modes.

Chapter 5 Demonstrates how to view test results with Inspector.

Chapter 6 Demonstrates how to analyze test results with Inspector.

Chapter 7 Demonstrates how to store and retrieve test results with Inspector.

Appendix A Shows the possible wiring diagrams for the RS-232 link.

Appendix B Support of files in LOTUS-123 and SYMPHONY

CONTENTS

		Page
1	**INTRODUCTION**	**1 – 1**
2	**INSTALLATION AND SET UP**	**2 – 1**
2.1	INSTALLATION OF THE SOFTWARE	2 – 1
2.2	INSTALLATION OF THE HARDWARE	2 – 1
2.2.1	IEEE-488 Interface	2 – 1
2.2.2	RS-232 Interface	2 – 2
2.3	START UP OPTIONS	2 – 3
3	**SET UP PM 6304 WITH INSPECTOR**	**3 – 1**
3.1	INITIALIZE	3 – 1
3.2	RCL METER PARAMETER SET UP	3 – 4
3.3	SET UP BIN PARAMETERS FOR PM 6304	3 – 8
4	**MEASURING WITH INSPECTOR**	**4 – 1**
4.1	NORMAL MEASURING MODE	4 – 1
4.2	BIN MEASURING MODE	4 – 6
5	**VIEW TEST RESULTS**	**5 – 1**
5.1	VIEW TEST RESULTS OF 'NORMAL MEASUREMENTS'	5 – 1
5.2	VIEW TEST RESULTS OF 'BIN MEASUREMENTS'	5 – 6
6	**ANALYZE TEST RESULTS**	**6 – 1**
7	**STORE AND RETRIEVE FILES**	**7 – 1**
	APPENDIX A	
	APPENDIX B	

1 INTRODUCTION

This manual describes the software version 2.0.

The PM2272 Inspector software is a PC-based program created for the Philips programmable RCL meter is controlled via RS-232 or IEEE interface of a PC. With the aid of a serial communication port (standard in any IBM-compatible PC) or via a Philips IEEE-488 interface card (PM 2201) the tasks of setting up the instrument, and collecting and analyzing measurement results are greatly simplified. Inspector can handle up to 9999 component values, allowing them to be stored, analyzed and represented in a graph or as a list.
The measurement results and instrument setups can be easily stored to and retrieved from disk.

All the front panel functions of the PM 6304 RCL meter can be controlled via a simple menu structure with pull down menus. Inspector can be controlled by a mouse and a keyboard or via the keyboard only.
Popular word processing and spread sheet packages can import the data files that have been created by the Inspector software.

System requirements

To use the Inspector software you need:

- An IBM PC/XT, PC/AT, PS/2 or a compatible computer with at least 512 Kb memory and preferably two serial interfaces.
- A color graphics monitor with video adapter. The Inspector program can drive most of the popular display adapters such as EGA and VGA.
- A 3 ½" floppy disk drive (hard disk is recommended).
- A serial mouse, for example Microsoft® (recommended).
  If you use a different mouse, you should press the mouse button long enough to perform start and stop functions during measurements.
- MS-DOS version 3.0 or later.
- PM 6304 with an RS-232 or IEEE-488 interface.

Conventions

Throughout this manual the keys that need to be pressed are indicated by **<KEY>**. When the word **Select** is used, it means: press the 'Capitalized character key' in the item, e.g. Select **<M>**easure means press the key M to enter the 'measure menu'.
For 'item' or 'command' the word item will be used in this manual.

HELP menu

There is an on-line help menu within Inspector. The user can activate the **HELP** function with function key '**F1**', exit **HELP** with **<ESC>**.

Selecting an item

The menu structure in Inspector is organized as follows:

- At the top of the computer display is the **main menu bar**.
- Each item in the main menu bar has one or more pull down menus. When a menu item is followed by an exclamation point, such as **View!**, there is no pull down menu for this item; you have direct access to this item.
- Selection in the pull down menu can be made by selecting the highlighted item using arrow keys or typing the capitalized letter, such as V for **View**.

To select an item with the **mouse**

- Put the mouse pointer (■) on one of the items in the main menu bar.
- Click the left mouse button to activate this item.

To cancel an item, press the right mouse button or **<ESC>**.

To select an item via the **keyboard**, proceed as follows:

- press the capital letter of the item required in the menu **or** select the required item with the cursor keys and press **<ENTER>**.
- To cancel an item, press the **<ESC>** key.

2 INSTALLATION AND SET UP

2.1 INSTALLATION OF THE SOFTWARE

Begin by making backup copies of the disk. Copy the disk onto a backup disk and store the distribution disk in a safe place.

To install Inspector on your hard disk insert the disk in the floppy drive (drive A in our example). At the DOS prompt enter the commands:

```
A:                      <RETURN>
MD C:\INSPECTR          <RETURN>
COPY *.* C:\INSPECTR    <RETURN>
```

These DOS commands create the INSPECTR directory on the hard disk and copy the files into this directory.

2.2 INSTALLATION OF THE HARDWARE

2.2.1 IEEE-488 Interface

Inspector software can communicate with the PM 6304 via the IEEE-488 or RS-232. For PM 6304 RCL meters equipped with an IEEE-488 interface:

- **Install a PM 2201 or National Instruments PCIIA IEEE-488 interface card in your PC.**
- **Install the interface software (GPIB.COM).**
- **Modify config.sys according to the installation instructions of PM 2201.**
- **Connect the PM 6304 to your interface card with an IEEE-488 cable (PM 2295).**
- **Set the address of the PM 6304 on : 20**

2.2.2 RS-232 Interface

For PM 6304 RCL meters equipped with an RS-232 interface:

- Connect the RCL meter with an RS-232 cable (e.g. PM 9536/041) to your PC on COM1 port (Inspector's default option is COM1).
- When you are using a mouse, connect and install this on COM2 port.
- The serial interface of the PM 6304 is configured as follows :

  BAUD rate : 9600
  DATA : 8
  PARity : n
  HANDShake : on
  CONNection : 3

The following operations set up the serial interface of your PM 6304:

Press "Interface' button 3 times
Select with '+' or '–' : **CO**mmunication (**PR** stands for PRINTER)
Press 'Interface'
Select with '+' or '–' : **BAUD 9.6 K**
Press 'Interface'
Select with '+' or '–' : **DATA 8**
Press 'Interface'
Select with '+' or '–' : **PAR n**
Press 'Interface'
Select with '+' or '–' : **HANDS on**
Press 'Interface'
Select with '+' or '–' : **CONN 3**

Other combinations of baudrate, data, parity, handshake and connection are allowed. When you select any communication settings in the instrument, the settings of Inspector must be modified to match.

2.3 START UP OPTIONS

Inspector is now ready for use.

To use the print options in the Inspector it is necessary to install the DOS graphics driver. If you have an HP-LaserJet (or 100 % compatible) you have to type the following DOS command before you start Inspector:

graphics laserjetii

For additional information regarding printer support with DOS graphics drivers, refer to your DOS manual, the 'graphics' command.

Change to the INSPECTR directory on the hard disk or disk drive and start the program by typing in the following commands:

e.g. **C:** **<RETURN>**
CD \INSPECTR **<RETURN>**
INSPECTR **<RETURN>**

For more information about start-up options, see next page.

Note: Be sure there is no mouse driver loaded for the COM port you are using for RCL meter communication.

To run Inspector from the floppy, enter the commands :

e.g. **A:** **<RETURN>**
INSPECTR

Note: Take care that there is no mouse driver loaded for the COM port you are using for RCL meter communication.

Certain options can be appended to the DOS level start-up command INSPECTR. The table on the next page lists these options.

Option	Description
?	An overview of the available start-up options is given, Inspector is not started.
COM:x	Inspector is default working on COM1. However, if there is a mouse connected to this COM1, Inspector must communicate with another COM port, e.g. COM2. With this option Inspector can be forced to an other COM port. x = 1 ... 8
MEM:x	This option reserves memory locations for the test figures. Default x = 5000, so 5000 components can be measured. The maximum value for x is 9999.
DPS:x	Decimal point separator which will only be used in the 'Export data' function. x = 0 Decimal point (.) in values Decimal comma (,) as separator x = 1 Decimal comma (,) in values Semicolon (;) as separator
LPT:x	Set the LPT port number to which the line printer is connected (x = 0 ... 3).
DMA	This is default selected. In this way you get the fastest screen update. The other possible mode is BIOS.
CGA	In this mode you won't see snow on your screen during screen updates. This mode is only important with CGA adapters.
BIOS	In this mode screen updates are handled by the BIOS and not via DMA. This mode is slower than the DMA mode.

Option	Description	
MONO	In this mode text screens will be in black and white	
M_PBCK:x	Set the menu screen background color. x = 0 ... 7	(1) ★
G_CBCK:x	Set the chart back ground color. x = 0 ... 15	(1)
G_CBRD:x	Set the chart border color. x = 0 ... 15	(14)
G_CTIT:x	Set the chart title color. x = 0 ... 15	(10)
G_DBCK:x	Set the data background color. x = 0 ... 15	(4)
G_DBRD:x	Set the data border color. x = 0 ... 15	(14)
G_DAXS:x	Set the axis label and axis value color. x = 0 ... 15	(3)
G_DPLT:x	Set the curve color. x = 0 ... 15	(7)
G_DHIL:x	Set the HI limit line color. x = 0 ... 15	(10)
G_DLOL:x	Set the LO limit line color. x = 0 ... 15	(11)

★ Values in brackets are default settings.

Screen colors :

x = 0	Black	X = 8	Gray
x = 1	Blue	x = 9	Light Blue
x = 2	Green	x = 10	Light Green
x = 3	Cyan	x = 11	Light Cyan
x = 4	Red	x = 12	Light Red
x = 5	Magenta	x = 13	Light Magenta
x = 6	Brown	x = 14	Yellow
x = 7	White	x = 15	High-Intensity White

Example:
INSPECTR COM:2 MEM:8000 G_DPLT:15, starts Inspector on COM2, reserves memory for 8000 components and the curve color is High-Intensity White.

3 SET UP PM 6304 WITH INSPECTOR

The following section gives you more information about how to set up the PM 6304 RCL meter with Inspector.

Note: When you run Inspector for the first time, the program will use a default configuration for interface parameters, colors etc.
Changes made to the entered command line options or selections made in the menus, will be stored to a special file (Inspectr.INI).
The next time you start up Inspector the Inspectr.INI file will be used as the default configuration.

3.1 INITIALIZE

Immediately after you start up Inspector you see the 'Operator ID' screen. In this screen you can fill in information about the operator, component type and manufacturer which is attached to any component data collected. You have the option of skipping this menu by pressing the **<ESC>** key or select **Ok**.

Select with the bar the item you want to fill in and type your name and other information. In case you want to modify an item, just select with the bar an item and press **<ENTER>**. Now you can edit the selected item.
This 'operator ID card' will be linked to the test results when stored on disk.

Ok means that you are ready with the 'operator ID' field and you want to go to the next field.

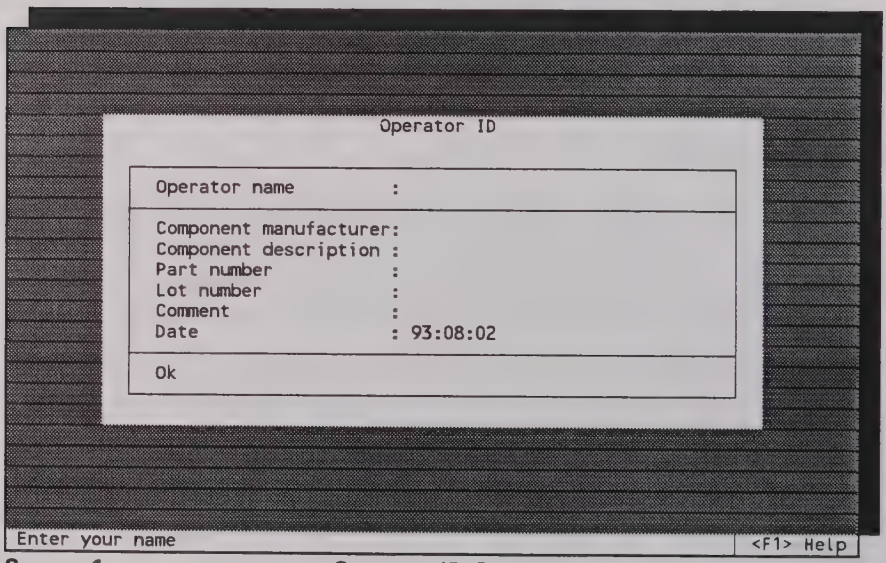
Quit exits Inspector and returns you to DOS.

Upon exiting the 'Operator ID' field, Inspector tries to set up communication with the RCL meter.

Link is made

When the link with the PM 6304 RCL meter is made, 'Instrument Setup' screen appears. If the instrument does not respond, you will see an error message.

Note : When you leave Inspector with 'Quit' (in the main menu) and 'Exit', the start up options and communication parameters will be automatically saved in the file 'Inspectr.ini'



Screen 1 Operator ID Screen

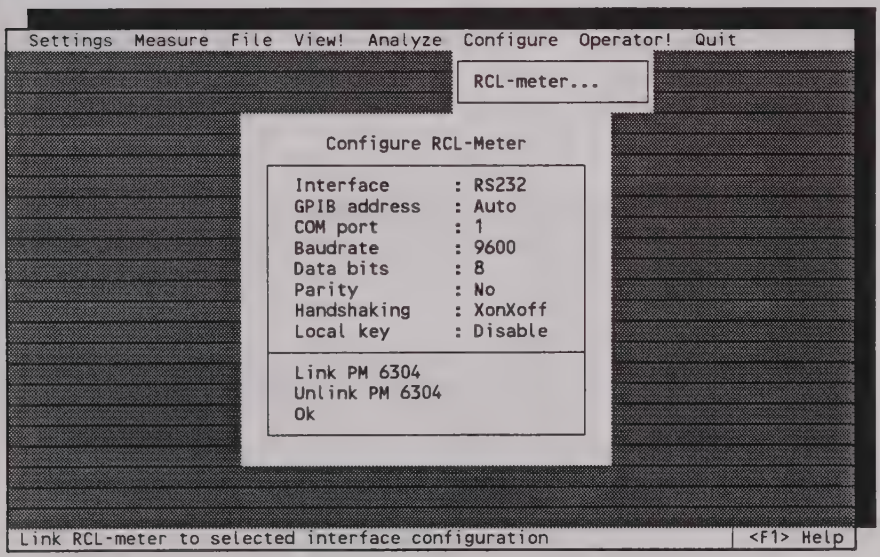
Link failed

You get an error message 'NO TALKER AT ADDRESS' on your screen. Press a key or click the left mouse button. The error message will disappear but remember there is **no link** with the RCL meter. Now you automatically get the 'Configure' menu. In this menu you can select and set up your communication mode and parameters.

Select '**<L>**ink PM 6304' to make the link between PM 6304 and your PC.

A note on Inspector Self-Demo mode:

You can run Inspector without an RCL meter connected for tasks such as retrieving and analyzing past test data saved on your disk. If you try to acquire data with no RCL meter attached, Inspector will assume you wish a self demo and will automatically generate simulated test results after you start the measure function. These test results are handled as normal test results but are created with a random number generator.



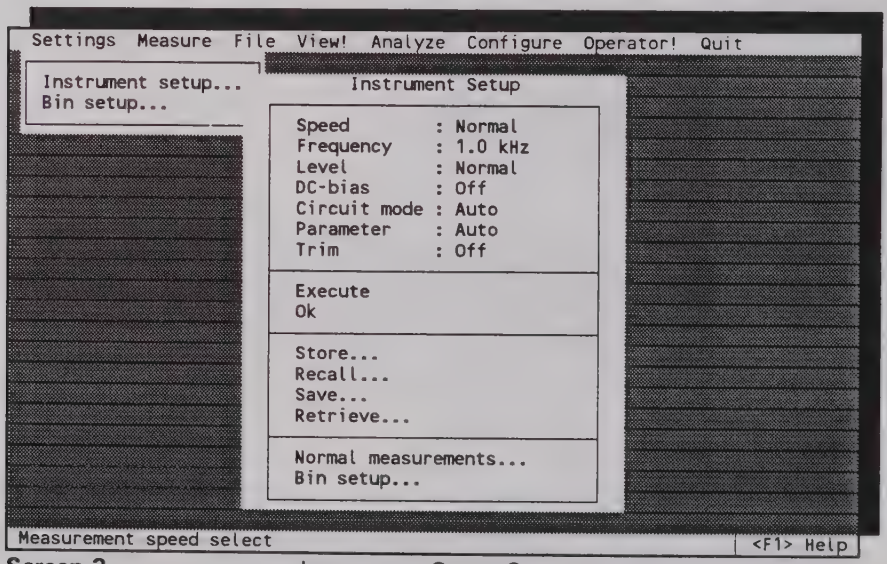
Screen 2 Configure RCL meter Screen

3.2 RCL METER PARAMETER SET UP

For the rest of this manual, it is assumed that the RCL meter is connected and the link has been properly made.
In the main menu of Inspector information is displayed about software version, communication parameters, how many components can be tested and how many components are tested.

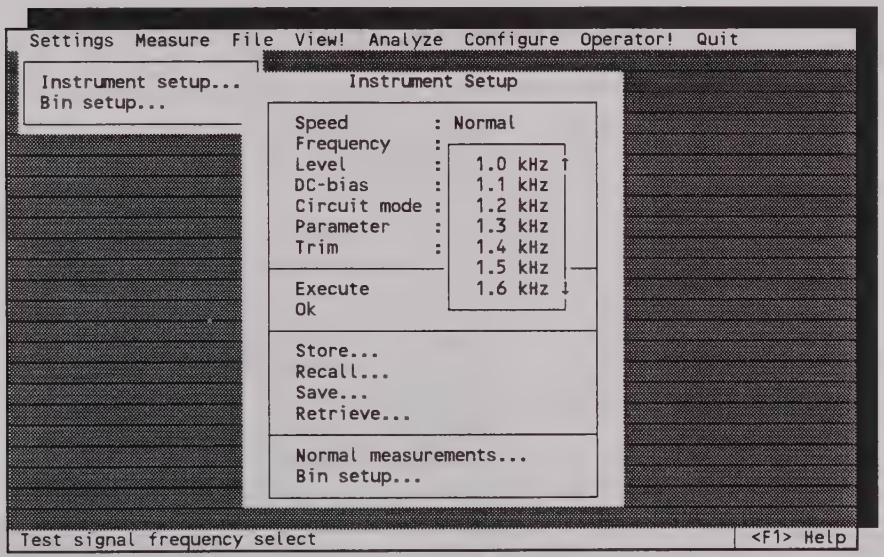
Press **<ESC>** three times. You are now in the top of the main menu and can select one of the pull down menus.

Select **<S>**ettings, select **<I>**nstrument setup.
Now you can control all the test parameters of the PM 6304. An example will be given for the frequency.



Screen 3 Instrument Setup Screen

Select <**F**>requency
Now you can scroll, with the mouse or with the cursor keys, through the complete frequency list. A fast scroll can be made with <**PgUp**> or <**PgDn**>. Press <**Enter**>, or place the mouse pointer on the wanted frequency and click the left mouse button to select your special test frequency.



Screen 4 Instrument Setup Screen with Frequency selected

After you have set up all the test signal parameters, you must select <**E**>xecute to send all these parameters to the RCL meter.

Note: The 'Bin Setup' parameters are **NOT** sent to the RCL meter; this must be done at the 'Bin Setup' menu.

Command	Sub-command	Comments
<S>peed	Normal Fast	2 meas./s - 0.1 % acc. - All freq. allowed 8 meas./s - 1 % acc. – limited freq. range
<F>requency	DC (opt.) 50 Hz 60 Hz ..... 100 kHz	
<L>evel	Normal Low High	1 V/100 Ω (AC and DC) 50 mV/100 Ω (AC), 300 mV/100 Ω (DC) 2 V/400 Ω (AC and DC)
<D>C-bias	Off Internal External	 2 V DC is added to the AC signal 0 ... 40 V may be added to the AC signal
<C>ircuit m.	Auto Series Parallel	Combinations with a capacitor will be calculated as a parallel circuit. Combinations with an inductance will be calculated as a serial circuit. Equivalent diagram is always series. Equivalent diagram is always parallel.
<P>arameter	Auto Z Φ D Q V I	The secondary parameter will be automatically determined (R, C or L). Secondary parameter: impedance Secondary parameter: phase angle Secondary parameter: dissipation factor Secondary parameter: quality factor Secondary parameter: monitor test voltage Secondary parameter: monitor test current

Command	Sub-command	Comments
<**T**>rim	Off On	No automatic trimming after execute. The old trim figures won't be changed. Automatic Trim procedure starts after execute. Old trim figures will be overwritten.
<**E**>xecute		This command sends the Inspector 'Instrument Setup' to the PM 6304.
<**O**>k		With this command you leave this menu.
Store	1 ... 9	Stores the 'Instrument setup' on the selected 'Instrument setting' memory location in the PM 6304 **and executes** the current 'Instrument Setup'
Recall	1 ... 9	Recalls a selected instrument setting in the PM 6304. The RCL meter **and** the 'Instrument Setup' in Inspector are updated after a recall.
Save	filename	Saves an 'Instrument Setup' on disk. The extension of the file is IDF (Inspector Data File).
Retrieve	filename	Reads an 'Instrument Setup' from disk. Use the select comand to get an overview of all *.IDF files. Use <**E**>xecute to make the retrieved 'Set Up' active on PM 6304.
<**N**>ormal		Fast way to go from 'Instrument Setup' to the normal measure mode. Same as <**M**>easure in main menu followed by <**N**>ormal.
<**B**>in setup		Fast way to go from 'Instrument Setup' to the bin setup mode. Same as <**S**>ettings in main menu followed by <**B**>in setup.

3.3 SET UP BIN PARAMETERS FOR PM 6304

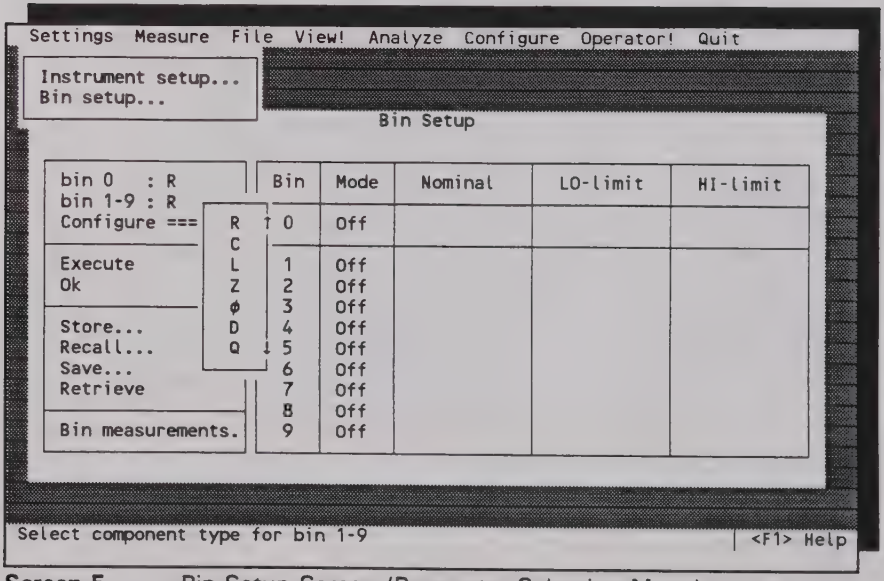
Binning means sorting into boxes, containers or similar.
During the binning process with the PM 6304, single items of similar components are allocated to defined sorting fields known as bins. The user can define a maximum of 10 bins. For more information regarding binning, like bin-nesting or bin-overlap, please read chapter "BINNING" in the operating guide of the PM 6304.

Go to the main menu of Inspector.

Select **<S>**ettings

Select **<B>**in setup

Now you can program all the bins. The parameter for bin 1 ... 9 can be selected from the menu. All the parameters for bin 1 ... 9 are equal.
An extra (second) selection criterium can be made with a special bin, namely bin 0. For more information about this special 'bin 0', please read chapter "BINNING" in the operating guide of the PM 6304.



Screen 5 Bin Setup Screen (Parameter Selection Menu)

Select in the 'parameter menu' which kind of component you would like to sort (in this example **R**) and press **<ENTER>**.

Select **<C>**onfigure

Select in the column 'MODE' the bin you want to program.

Press **<ENTER>**

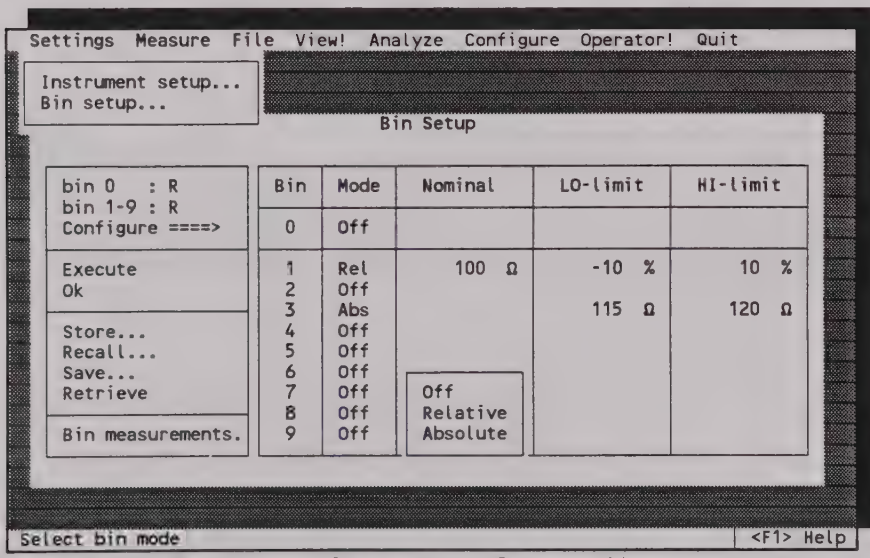
You can program a bin in the following modes :

Off : bin is disabled

Relative mode : Nominal value (absolute), LO and HI-limit (in %)
Example : Nominal = 100 Ω, LO-limit = −10 %, HI-limit = +10 %

Absolute mode : LO-limit (absolute) and HI-limit (absolute)
Example : LO-limit = 115 Ω, HI-limit = 120 Ω

Each bin may be programmed independently in the absolute or relative mode.



Screen 6 Bin Setup Screen (Mode Selection Menu)

There are several formats allowed to specify the values for the bins. Below you see an example for a resistor of 25.8 kΩ.

Allowed	**NOT** allowed
25800 **<ENTER>** 25.8E3 **<ENTER>** 25.8k **<ENTER>**	25k8 **<ENTER>**

It is NOT allowed to specify the dimension such as Ω, F or H, because these are already linked to the selected Bin parameter. An overview of the other parameter/ dimension links is given below.

Parameter	**Dimension**
R	Ω
C	F
L	H
Z	Ω
Q	no dimension
D	no dimension
Φ	°

Press **<ESC>** or the right mouse button to leave the 'configure' mode. Your RCL meter is not yet configured with the 'Bin Setup' you just defined.
You must select **<E>**xecute to send all the bin parameters to the RCL meter.
The test signal parameters are **NOT** sent to the RCL meter; this must be done at the 'Instrument Setup' menu.

Command	Sub-command	Comments
<**E**>xecute		This command sends the Inspector Bin Setup to the PM 6304.
<**O**>k		With this command you leave this menu.
Store	1 ... 9	Stores the 'Bin Setup' on the selected Bin setting memory in the PM 6304 **and executes** the current 'Bin Setup' setting. The 'Instrument Setup' (test signal) will not be influenced.
Recall	1 ... 9	Recalls a selected bin setting in the PM 6304. The RCL meter **and** the 'Bin Setup' menu in Inspector will be updated after a recall. The 'Instrument Setup' (test signal) will not be influenced.
Save	filename	Saves a 'Bin Setup' on disk. The extension of the file is IDF (Inspector Data File).
Retrieve	filename	Reads a 'Bin Setup' from disk. Use the select command to get an overview of all *.IDF files. Use <**E**>xecute to make the retrieved 'Set Up' active on PM 6304.
<**B**>in measurements		Fast way to go from this menu to <**B**>in measurements. The same as <**M**>easure in main menu followed by <**B**>in measurements.

4 MEASURING WITH INSPECTOR

There are two measure modes possible with Inspector:
- Normal measurements
- Bin measurements

Note: If there is no RCL meter linked, it is possible to generate test results randomly. In this random mode the test results are **NOT** related to the 'Instrument Setup' or 'Bin Setup'.

4.1 NORMAL MEASURING MODE

In this mode, the dominant and secondary test results are captured and displayed by Inspector. Important information such as dominant and secondary component values are displayed on the PC.

Select <**M**>easure in the main menu

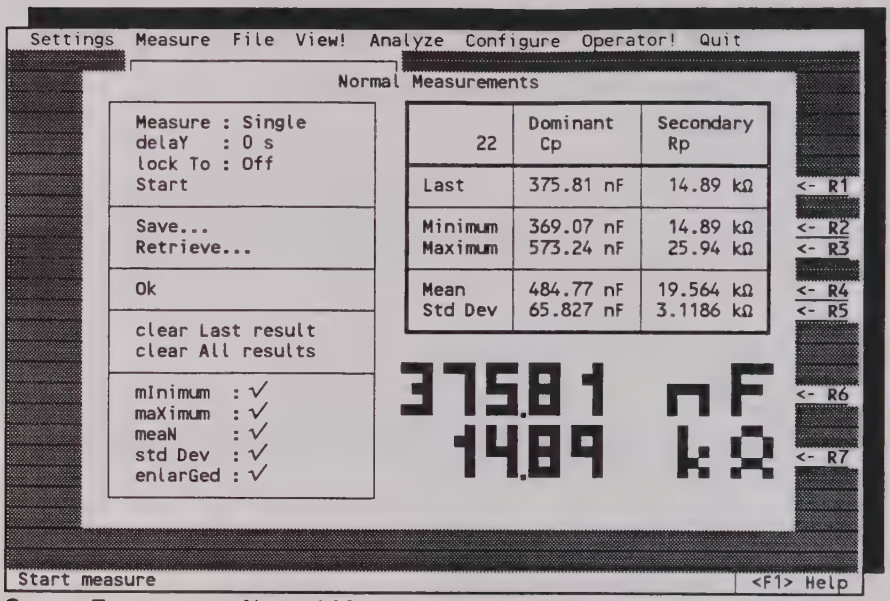
Select <**N**>ormal measurements

Select <**M**>easure

There are three different measurement-trigger modes for the RCL meter. After you have selected the measure function in the 'Normal measurements' screen, you can select one of the following measurement-trigger modes:

Continuous	Inspector will capture continuously test results from the RCL meter.
Single	Inspector will capture a single measurement after selecting <**S**>tart.
External	Inspector will start a measurement after an external trigger on the optional handler interface occurred.

Select <**S**>tart to trigger a single or the continuous measurement function. After selecting <**S**>tart in the continuous mode, this field is automatically changed in <**S**>top.



Screen 7 Normal Measurement Mode Screen

Explanation of **R1 ... R7** in the 'Normal measurements' screen printed above.

R1: 22 The total amount of captured test results.
375.81 nF The last measured dominant value.
14.89 kΩ The last measured secondary value.

R2: The minimum value of all measured dominant and secondary values.

R3: The maximum value of all measured dominant and secondary values.

R4: The mean value of all dominant and secondary values.
Calculation: All the dominant values are added together and divided by the number of measurements.

R5: The standard deviation of all dominant values.
Calculation: From each value, the mean value is subtracted. These results are squared and added together. This total summation is divided by the number of measurements. From this result the square root is taken and is called the Standard Deviation.

R6: The dominant value of the last measurement.

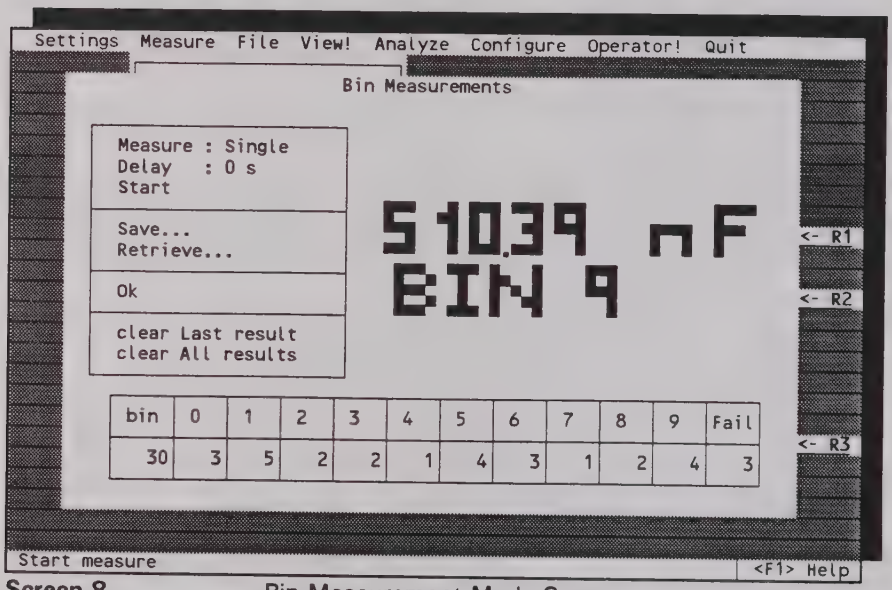
R7: The secondary value of the last measurement.

Command	Sub-command	Comments
<**M**>easure	Continuous	Test results are continuously captured by Inspector.
	Single	After each 'Start' command the new test results are captured.
	External	After each external trigger the new test results are captured.
dela<**Y**>		The interval between triggering the RCL meter and capturing the data is programmable. The maximum time between trigger-moment and capturing is 86400 seconds (24 hours.)

Command	Sub-command	Comments
lock <**T**>o		Disables the automatic dominant component function of the RCL meter. The Lock <**T**>o function is especially useful when the operator is only interested in the R, C, or L value of components where the Q or D factor varies around 1. **Lock Off**: For capacitors or inductances with a Q factor smaller than 1, the resistor will be detected as dominant. If the Q factor is higher than 1, the inductance or capacitance will be detected as dominant. **Lock R,C,L**: The R, C, or L value of the component will always be displayed as dominant value. If the swapped dominant value is infinite, the measurement will be ignored. **Be aware that the 'Lock' function can swap the dominant and secondary value of the component under test.** The 'Lock' function can only be programmed before the first measurement starts or after a 'clear All results' command.
<**S**>tart		Starts a single or continuous measurement cycle. In the continuous mode, the 'start' command will be automatically altered in <**S**>top after a 'start'.
Save	filename	Saves the 'Normal measurement' results on disk. The extension of the file is IDF (Inspector Data File).

Command	Sub-command	Comments
Retrieve	filename	Reads the 'Normal measurement' results from disk. Use the select command to get an overview of all *.IDF files.
<**O**>k		With this command you leave this menu.
clear <**L**>ast result		Clears the last test result. Minimum, maximum, mean, standard deviation and enlarged are automatically updated.
clear <**A**>ll with 'Yes'.		Clears **ALL** the test results after you results confirmed with 'Yes'.
m<**I**>nimum : ✓		The '✓' sign indicates that the minimum value of the total batch will be displayed. Select <**I**> to switch on or off.
ma<**X**>imum : ✓		The '✓' sign indicates that the maximum value of the total batch will be displayed. Select <**X**> to switch on or off.
mea<**N**> : ✓		The '✓' sign indicates that the mean value of the total batch will be displayed. Select <**N**> to switch on or off.
std<**D**>ev : ✓		The '✓' sign indicates that the standard deviation of the total batch will be displayed. Select <**D**> to switch on or off. **Note:** The standard deviation calculation can slow down the measure function for large component batches.
enlar<**G**>ed : ✓		Displays the dominant and secondary test results enlarged on your PC screen. Select <**G**> to switch on or off.

4.2 BIN MEASURING MODE



Screen 8 Bin Measurement Mode Screen

Explanation of **R1 ... R4** in the 'Bin measurements' screen printed above.

R1: 510.39 nF — This is the last measured dominant value.

R2: BIN 9 — The last measured dominant value (510.39 nF) fits in bin 9.

R3: — This table shows how many components are located in each bin. The number below the text 'bin' indicates how many components are tested.

Command	Sub-command	Comments
<**M**>easure	Continuous Single External	Test results are continuously captured by Inspector. After each 'Start' command the new test results are captured. After each external trigger the new test results are captured.
dela<**Y**>		The interval between triggering the RCL meter and capturing the data is programmable. The maximum time between trigger-moment and capturing is 86400 seconds (24 hours.)
<**S**>tart		Starts a single or continuous measurement cycle. In the continuous mode, the 'start' command will be automatically altered in <**S**>top after a 'start'.
Save	filename	Saves the 'Bin measurement' results on disk. The extension of the file is IDF (Inspector Data File).
Retrieve	filename	Reads the 'Bin measurement' results from disk. Use the select command to get an overview of all *.IDF files.
<**O**>k		With this command you leave this menu.
clear <**L**>ast result		Clears the last test result. Minimum, maximum, mean, standard deviation and enlarged are automatically updated.
clear <**A**>ll with 'Yes'.		Clears **ALL** the test results after you results confirmed with 'Yes'.

5 VIEW TEST RESULTS

With Inspector the test results can be shown in different ways. Depending on which measurement mode (bin or normal), you can view the test results in a list, graph or histogram.
It is also possible to print out the test results in a list with all relevant information.

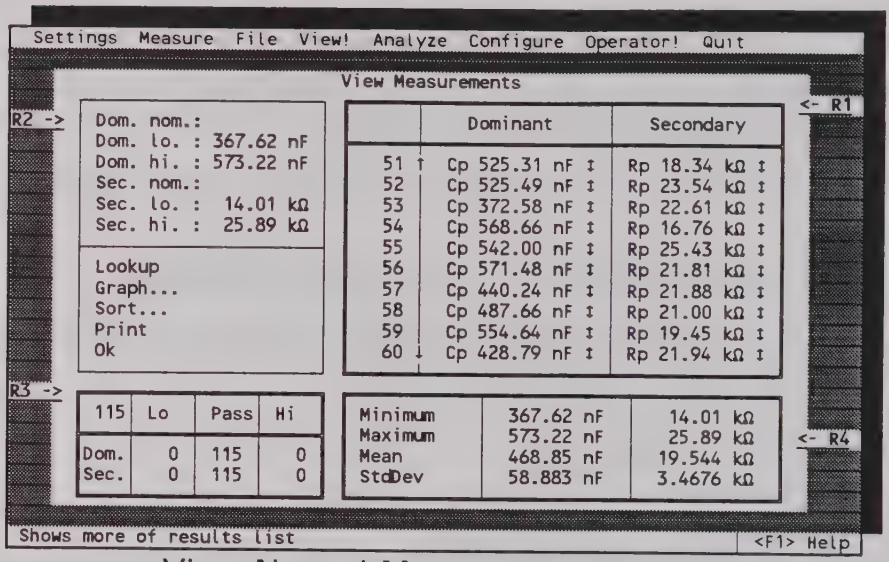
5.1 VIEW TEST RESULTS OF 'NORMAL MEASUREMENTS'

On this screen you get all information regarding your test results of the **complete** batch of components. Important information like:

Minimum value
Maximum value
Mean value
Standard deviation
How many components did PASS

are visible at a glance. The range limits for 'dominant' and 'secondary' are freely programmable. After you change the range limits, Inspector immediately shows you how many components are in the three areas (High, Pass, Low).

Each test result is indicated with a symbol which shows you if the result is 'PASS' (↕) , 'HI' (↑) or 'LO' (↓).


Settings Measure File View! Analyze Configure Operator! Quit
View Measurements
R2 ->
Dom. nom.:
Dom. lo. : 367.62 nF
Dom. hi. : 573.22 nF
Sec. nom.:
Sec. lo. : 14.01 kΩ
Sec. hi. : 25.89 kΩ
Lookup
Graph...
Sort...
Print
Ok
<- R1
Dominant
Secondary
51 ↑ Cp 525.31 nF ↕ Rp 18.34 kΩ ↕
52 Cp 525.49 nF ↕ Rp 23.54 kΩ ↕
53 Cp 372.58 nF ↕ Rp 22.61 kΩ ↕
54 Cp 568.66 nF ↕ Rp 16.76 kΩ ↕
55 Cp 542.00 nF ↕ Rp 25.43 kΩ ↕
56 Cp 571.48 nF ↕ Rp 21.81 kΩ ↕
57 Cp 440.24 nF ↕ Rp 21.88 kΩ ↕
58 Cp 487.66 nF ↕ Rp 21.00 kΩ ↕
59 Cp 554.64 nF ↕ Rp 19.45 kΩ ↕
60 ↓ Cp 428.79 nF ↕ Rp 21.94 kΩ ↕
R3 ->
115 Lo Pass Hi
Dom. 0 115 0
Sec. 0 115 0
Minimum 367.62 nF 14.01 kΩ
Maximum 573.22 nF 25.89 kΩ
Mean 468.85 nF 19.544 kΩ
StdDev 58.883 nF 3.4676 kΩ
<- R4
Shows more of results list
<F1> Help

Screen 9 View Normal Measurement Results

Explanation of **R1 ... R4** in the 'View Measurements' (Normal Measurements mode) screen printed above.

R1: These are the test results. By selecting the 'Lookup' item you can scroll through the whole table. The window has a maximum length of 10 test results.

↕ symbol : test result is In-Range '**Pass**'.

↑ symbol : test result is Over-Range '**Hi**'.

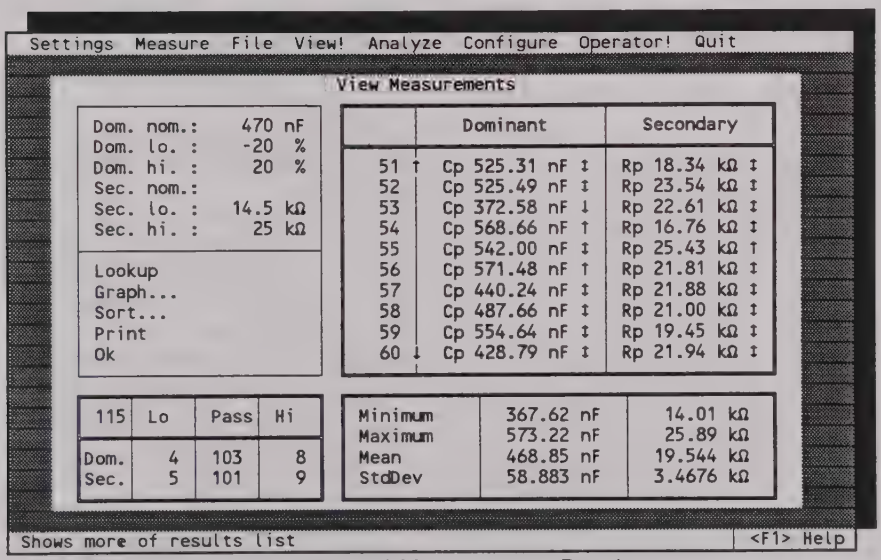
↓ symbol : test result is Under-Range '**Lo**'.
The range for 'Hi', 'Pass' and 'Lo' can be programmed in this menu. For more information see **R2**.

R2: These default limits are equal to the minimum and maximum dominant and secondary values of the total batch. It is also possible to program the dominant and secondary range.

You can program a relative or absolute range. If you want to program relative, first define 'Dom. nom.' or 'Sec. nom.' (example **Dom**inant **nom**inal 470 nF). Now you can program the **hi**gh and **lo**w limit in '%'.
For absolute programming you first select Dom. lo. and program the low limit. Select Dom. hi. to program the upper limit.
To set 'Dom. lo.' and 'Dom. hi.' equal to the minimum and maximum value of the total batch, just select 'Dom. nom.' press **<SPACE>** and press **<ENTER>**.

R3: In this table you see how many components are 'Lo', 'Passed' and 'Hi'. The range can be set for the dominant and secondary parameters in the table above.

R4: In this table you see the minimum, maximum, mean value and the standard deviation of the total batch. These figures are not related to the free programmable range.

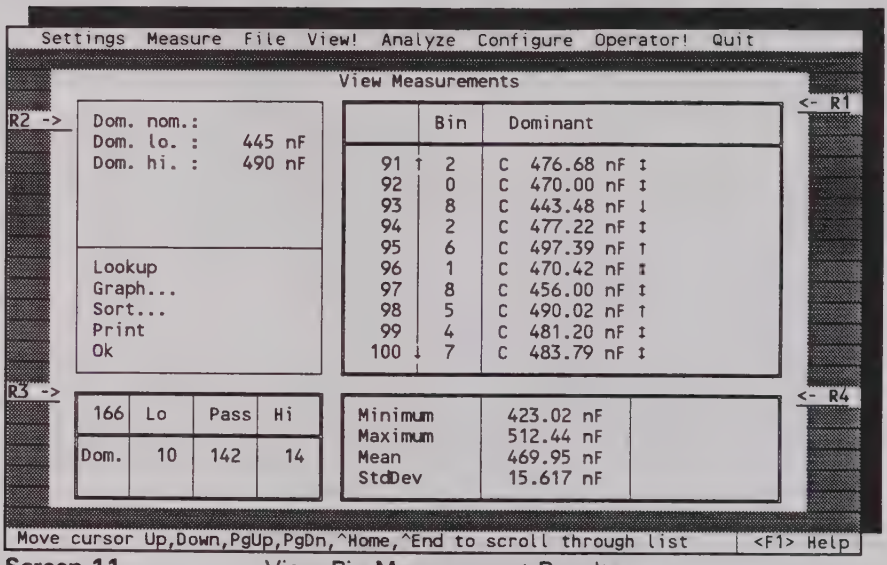

Settings Measure File View! Analyze Configure Operator! Quit
View Measurements
Dom. nom.: 470 nF
Dom. lo. : -20 %
Dom. hi. : 20 %
Sec. nom.:
Sec. lo. : 14.5 kΩ
Sec. hi. : 25 kΩ
Lookup
Graph...
Sort...
Print
Ok
Dominant
Secondary
51 Cp 525.31 nF Rp 18.34 kΩ
52 Cp 525.49 nF Rp 23.54 kΩ
53 Cp 372.58 nF Rp 22.61 kΩ
54 Cp 568.66 nF Rp 16.76 kΩ
55 Cp 542.00 nF Rp 25.43 kΩ
56 Cp 571.48 nF Rp 21.81 kΩ
57 Cp 440.24 nF Rp 21.88 kΩ
58 Cp 487.66 nF Rp 21.00 kΩ
59 Cp 554.64 nF Rp 19.45 kΩ
60 Cp 428.79 nF Rp 21.94 kΩ
115 Lo Pass Hi
Dom. 4 103 8
Sec. 5 101 9
Minimum 367.62 nF 14.01 kΩ
Maximum 573.22 nF 25.89 kΩ
Mean 468.85 nF 19.544 kΩ
StdDev 58.883 nF 3.4676 kΩ
Shows more of results list
<F1> Help

Screen 10 View Normal Measurement Results

Command	Sub-command	Comments
<**L**>ookup		After selecting this item you can scroll through the complete table. ▪ **Cursor <up>/<down>** or mouse pointer on '↑' or '↓' to scroll step by step. ▪ **<PgUp>**, **<PgDn>** to show the next or previous 10 results in the list. ▪ **<CTRL>+<Home>**, **<CTRL>+<End>** to show respectively the first and the last result of the total list. Use the **<Delete>** key to remove a complete test result from the table. The minimum, maximum, mean and StdDev are re-calculated.
<**G**>raph	<**D**>ominant	Shows all the dominant test results, in a line graph.
	<**S**>econdary	Shows all the dominant test results, in a point graph.
	<**B**>oth	Shows all the dominant and secondary test results in two separate graphs simultaneously.
	<**C**>onfigure	With this item you can configure the **vertical** axis for the dominant and secondary graphs. <**A**>uto The lowest Y-value is the minimum value of total batch.The highest Y-value is the maximum value of total batch. <**L**>ower In this manual mode you can program the lowest value for the vertical axis of your graph.

Command	Sub-command	Comments
<**G**>raph	<**C**>onfigure	<**U**>pper In this manual mode you can program highest value for the vertical axis of your graph.
	<**P**>rint	Makes a hard copy of the current graph and the comment at the bottom of the display. This command is equal to "SHIFT+Print Screen". Select with DOS command "Graphics" the right printer setup.
	<**O**>k	With this command you leave this menu.
<**S**>ort	<**I**>ndex	With this item you can sort the test result numbers. In the <**A**>scending mode the smallest value is at top of the list. In the <**D**>escending mode the largest value is at top of the list.
	<**D**>ominant	Sorts the dominant values in ascending or descending order.
	<**S**>econdary	Sorts the secondary values in ascending or descending order.
	<**O**>k	With this command you leave the sort menu.
<**P**>rint		Prints **all** the test results in table form (ASCII format). The printer port must be specified during the first start-up session. See Section 2.3.

5.2 VIEW TEST RESULTS OF 'BIN MEASUREMENT'



Screen 11 View Bin Measurement Results

Explanation of **R1 ... R4** in the 'View Measurements' (Bin Measurement mode) screen printed above.

R1: These are the test results. By selecting the 'Lookup' item you can scroll through the whole table. The window has a maximum length of 10 test results.

↕ symbol : test result is "Passed".

↑ symbol : test result is "High".

↓ symbol : test result is "Low".

The range limits for 'Hi', 'Pass' and 'Lo' can be programmed in this menu. For more information see **R2**.

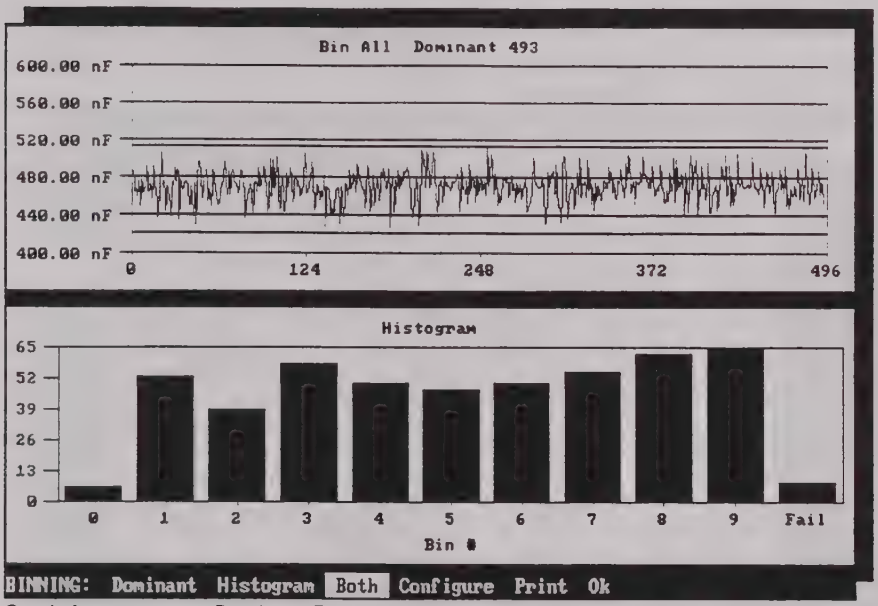
R2: These default limits are equal to the minimum and maximum dominant values of the total batch. It is also possible to program the range limits.
You can program a relative or absolute range. If you want absolute program, first define 'Dom. lo.' (example **Dom**inant **lo**w 470 nF). Now you can program **Dom**inant **hi**gh.
For relative programming you first select Dom. nom. and then program the low and high limits.
To set 'Dom. lo.' and 'Dom. hi.' equal minimum and maximum values of the total batch, just select 'Dom. nom.' press **<SPACE>** and press **<ENTER>**.

R3: In this table you see how many components are '**Lo**', '**Pass**ed' and '**Hi**'. The range can be set for the dominant value only. The size of the total batch is given in the upper left corner of this sub-table.

R4: In this table you see the minimum, maximum, mean value and the standard deviation of the total batch. These figures are not related to the free programmable range.

Command	Sub-command	Comments
<**L**>ookup		After selecting this item you can scroll through the complete table. ▪ **Cursor <up>/<down>** or mouse pointer on '↑' or '↓' to scroll step by step. ▪ **<PgUp>**, **<PgDn>** to show the next or previous 10 results in the list. ▪ **<CTRL>+<Home>**, **<CTRL>+<End>** to show the beginning or the end of the total list. Use the **<Delete>** key to remove a complete test result from the table. The minimum, maximum, mean and StdDev are re-calculated. You can exit this function with **<ESC>**.
<**G**>raph		For more information see next page.
<**S**>ort	<**I**>ndex <**B**>in <**D**>ominant <**O**>k	With this item you can sort the test result numbers. In the **<A>**scending mode the smallest value is at top of the list. In the **<D>**escending mode the largest value is at top of the list. Sorts the bin numbers in an ascending or descending order. Sorts the dominant values in ascending or descending order. With this command you leave the sort menu.
<**P**>rint		Prints **all** the test results in table form. The printer port must be specified during the first start-up session. See Section 2.3. Output format: ASCII.

Sub-commands for the <G>raph menu.



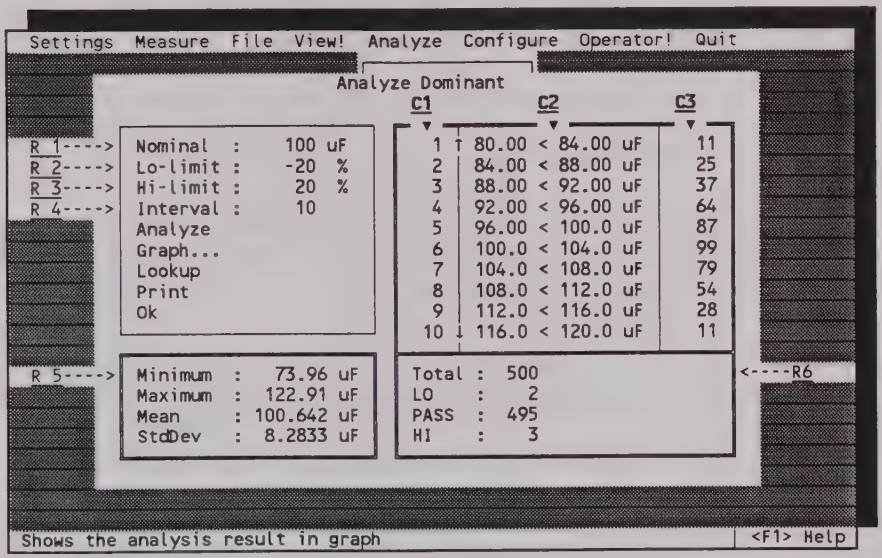
Graph 1 Dominant Results all Bins and Histogram (Both)

Command	Sub-command	Comments
<D>ominant		Shows the dominant test results, in a line graph, of a selected bin or all bins.
<H>istogram		Shows in a histogram how many components are located in each bin.
<B>oth		Shows the dominant test results of the selected bin(s) in a line graph and the bin results in a histogram simultaneously.

Command	Sub-command	Comments
<**C**>onfigure		With this item you can configure both the dominant line graph and the histogram.
	<**D**>ominant	
	<**A**>ll	Shows a line graph of the real values of the components in **all** the bins.
	<**0..9**>	Shows a line graph of the real values of the components of the selected bin.
	<**F**>ail	Shows a line graph of the real values of the components in the **fail** bin.
	<**S**>caling	
	<**A**>uto	The lower limit is the minimum value of total batch.The upper limit is the maximum value of total batch.
	<**L**>ower	In this manual mode you can program the minimum value for the vertical axis of your graph.
	<**U**>pper	In this manual mode you can program the maximum value for the vertical axis of your graph.
	<**O**>k	With this command you leave this menu.
	<**H**>istogram	
	<**A**>uto	Minimum value on Y-axis is 0 and maximum value is equal to the quantity of the fullest bin.
	<**1**>00%	Minimum value on Y-axis is 0 % and maximum value is 100 %.
	<**O**>k	With this command you leave this menu.
<**P**>rint		Makes a hard copy of the current graph and the comment at the bottom of the display. This command is equal to "SHIFT+Print Screen". Select with DOS command "Graphics" the right printer setup. See Section 2.3.
<**O**>k		With this command you leave this menu.

6 ANALYZE TEST RESULTS

In the analyze mode test results are divided over linear intervals. The number of intervals and the total range are freely programmable in this menu.


Settings Measure File View! Analyze Configure Operator! Quit
Analyze Dominant
C1 C2 C3
R 1----> Nominal : 100 uF
R 2----> Lo-limit : -20 %
R 3----> Hi-limit : 20 %
R 4----> Interval : 10
Analyze
Graph...
Lookup
Print
Ok
1 80.00 < 84.00 uF 11
2 84.00 < 88.00 uF 25
3 88.00 < 92.00 uF 37
4 92.00 < 96.00 uF 64
5 96.00 < 100.0 uF 87
6 100.0 < 104.0 uF 99
7 104.0 < 108.0 uF 79
8 108.0 < 112.0 uF 54
9 112.0 < 116.0 uF 28
10 116.0 < 120.0 uF 11
R 5----> Minimum : 73.96 uF
Maximum : 122.91 uF
Mean : 100.642 uF
StdDev : 8.2833 uF
Total : 500
LO : 2
PASS : 495
HI : 3
<----R6
Shows the analysis result in graph
<F1> Help

Screen 12 Analyze Dominant Parameter

Explanation of **C1 ... C3** and **R1 ... R6** in the 'Analyze Dominant parameter' screen printed above.

C1: In this column you see the interval number.

C2: In this column you see the limits of each separate interval.

C3: In this column an overview is given on how many components fit in each separate interval.

R1: In case you want to program the 'interval range' in the relative way, you must specify here the nominal value of the 'interval range'

R2: Here you program the low limit for the 'interval range'. If there is no nominal value specified, the 'Lo limit' is automatically programmed in the absolute mode.

R3: Here you program the high limit for the 'interval range'. If there is no nominal value specified, the 'Hi limit' is automatically programmed in the absolute mode.

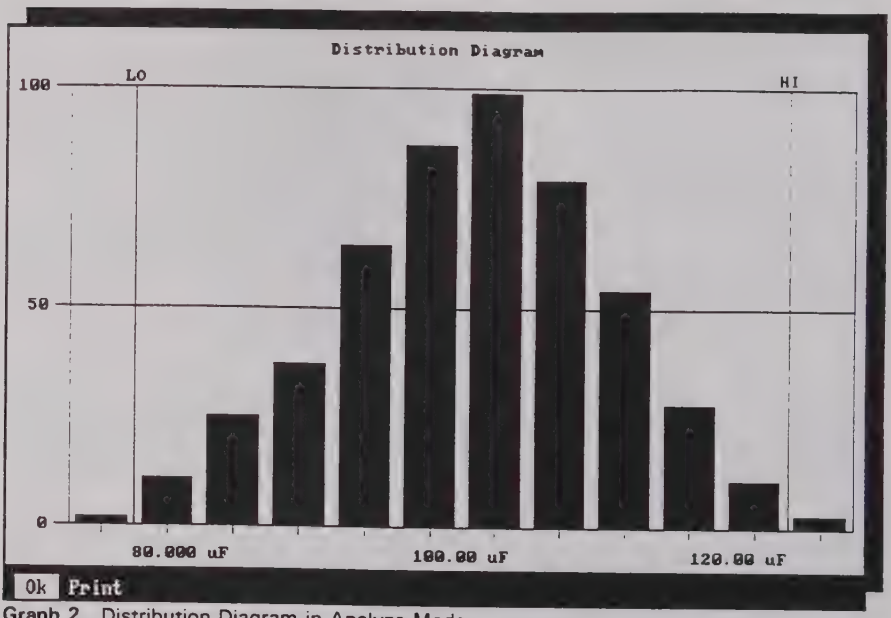
R4: In this row you can specify the number of linear intervals between the Lo- and Hi-limit. Components which do not fit between the Lo- and Hi-limit are automatically placed in the HI or LO interval.

R5: In this table you see the minimum, maximum, mean and standard deviation of the total component batch.

R6: In this table you see information about the total interval.

Total	:	500	(500 components are measured)
LO	:	2	(2 components are smaller than 'Lo-limit')
PASS	:	495	(495 fit in the user defined interval between Lo- and Hi-limit)
LO	:	3	(2 components are larger than 'Hi-limit')

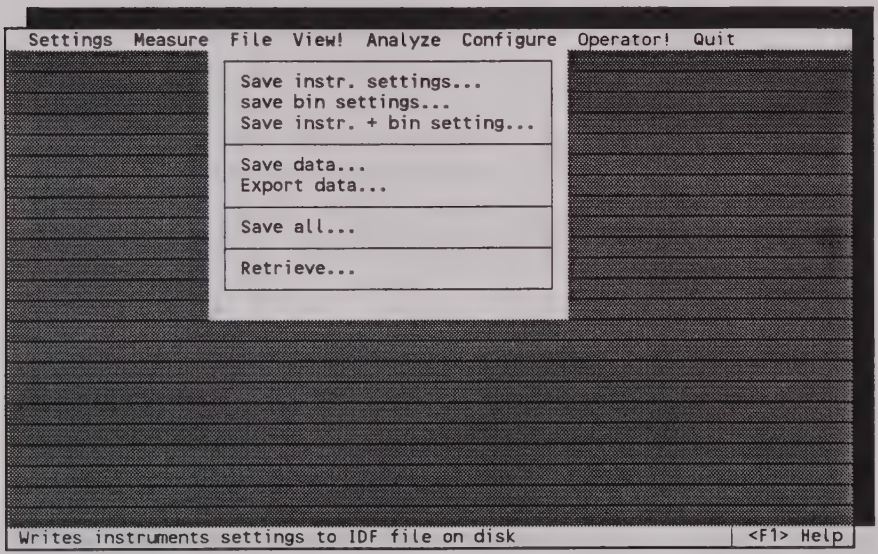
Command	Sub-command	Comments
<**A**>nalyze		After the limits are set you have to execute the analyze command. The analyze command must also be used if you modify the interval limits.
<**G**>raph		Shows you the distribution diagram of the intervals. Two additional intervals are displayed for 'Lo' and 'Hi'.
	<**O**>k	Return to the analyze function.
	<**P**>rint	Makes a hard copy of the current graph. This command is equal to 'SHIFT+Print Screen'. Select with DOS command 'Graphics' the right printer setup. See Section 2.3.
<**L**>ookup		After selecting this item you can scroll through the complete table. ▪ **Cursor <up>/<down>** or mouse pointer on '↑' or '↓' to scroll step by step. ▪ **<PgUp>**, **<PgDn>** to show the next or previous 10 results in the list. ▪ **<CTRL>+<Home>**, **<CTRL>+<End>** to show the beginning or the end of the total list.
<**P**>rint		Prints **all** the interval results in table form. The printer port must be specified during the first start-up session. See Section 2.3. Output format: ASCII.
<**O**>k		With this command you leave this menu.



Graph 2 Distribution Diagram in Analyze Mode

7 STORE AND RETRIEVE FILES

In the file sub-menus it is possible to use different options to store or retrieve information. The same functions are possible in the 'Settings' and 'Measure' menus.



Screen 13 File Submenu Screen

Save Instrument setting

The complete **Instrument Setup** panel and **Operator ID** will be stored in a file on disk with the extension IDF. You can specify a file name with a length of eight characters. It is not allowed to change the extension IDF.
It is also possible to overwrite an existing file. Select the file via the 'select...' command or by the **<TAB>** key.

Save Bin setting

The complete **Bin Setup** panel and **Operator ID** will be stored in a file on disk. The extension of the file is IDF. You can specify a file name with a length of eight characters. It is not allowed to change the extension IDF.
It is also possible to overwrite an existing file. Select the file via the 'select...' command or by the **<TAB>** key.

Save Instrument and Bin setting

The **Instrument Setup**, **Bin Setup** and **Operator ID** will be stored in a file on disk. The extension of this file is IDF. You can specify a file name with a length of eight characters. It is not allowed to change the extension IDF.

Save data

All the **measurement results** (Bin or Normal) and **Operator ID** will be stored in a file on disk. The extension of this file is IDF.

Export data

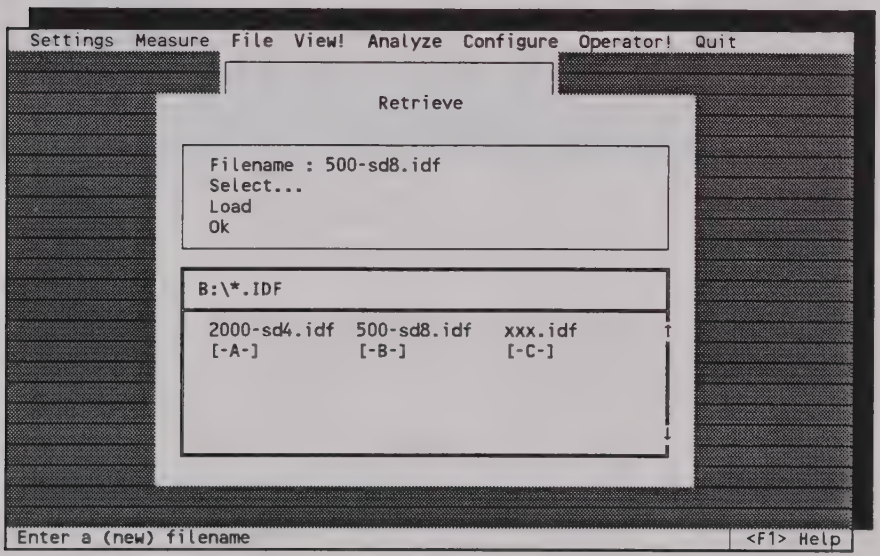
All the **measurement results** and **Operator ID** will be stored in a file with extension CSV. The test results are converted to standard ASCI format. The separator between each test result depends on which start-up option is used.
DPS:0 Decimal point indicator : . Test result separator : ,
DPS:1 Decimal point indicator : , Test result separator : ;
The converted test results can be used in spread sheet programs like Excel and Symphony. For more information about how to import these converted test results, see Appendix B.

Save all

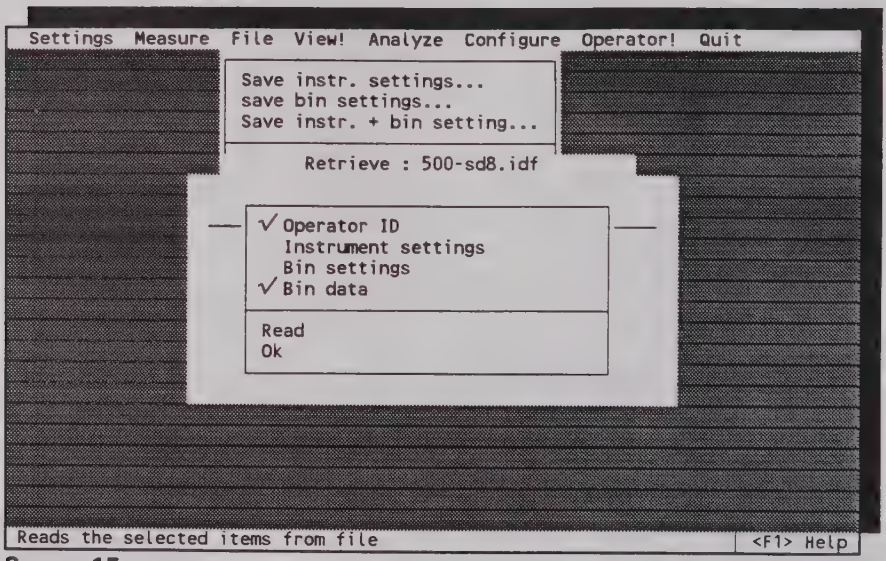
The **Instrument Setup**, **Bin Setup**, **Measurement results** and **Operator ID** will be stored in a file with extension IDF.

Retrieve

With this item you can retrieve all files with extension IDF. The filename can be specified via the keyboard or selected via the 'Select...' command. It is also possible to use the **<TAB>** key to go direct to the file select function. Select your file with the highlighted bar and press **<ENTER>**.
After you have selected a filename, you must select **<L>**oad. Now you get information about the contents of the selected file. The '✓' sign means that this item will be read from the selected file. You can disable the retrieve function for a selected item in a file. Select this item and press **<ENTER>**. The '✓' is disappeared and the item won't be read from disk.
The data is imported by Inspector after the **<R>**ead command.



Screen 14

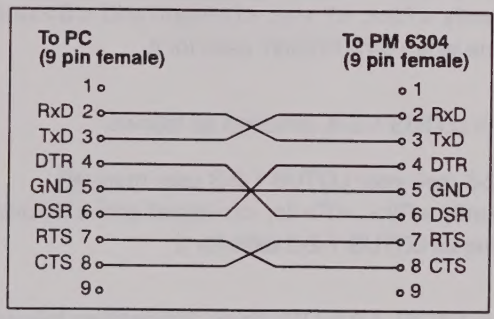


Screen 15

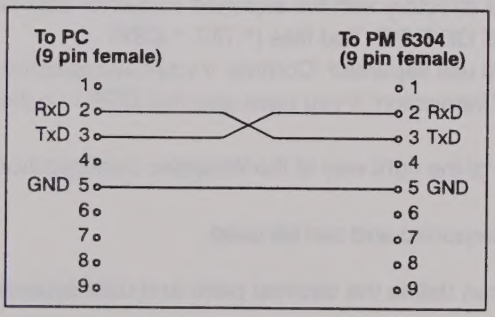
Note: After you read an **Instrument Setup** or **Bin Setup**, you must use **<E>**xcute to the new setting to the PM 6304 !!

APPENDIX A

This appendix contains information about the RS-232 cables that can be used to make a connection between the RCL meter and the PC. A screened cable with two 9 pin female D-connectors and a length of 3 meters is available as PM 9536/041. This cable is specialy designed for serial communication between a PC and the RCL meter.
PC as well as PM 6304 are DTE (Data Terminal Equipment).



7-wire connection with hardware handshake
(Ordering number: PM 9536/041)



3-wire connection without hardware handshake

APPENDIX B

ASCII data, saved with the 'File-Export' function of Inspector, can be imported in LOTUS-SYMPHONY, LOTUS 1-2-3, or EXCEL for Windows. The data imported in the spreadsheet, can be used to perform calculations with.

To import the data in LOTUS SYMPHONY, proceed as follows:

- Start SYMPHONY (see your SYMPHONY user manual)
- Select subsequently <F9>, <F>ile, <I>mport and <S>tructured
- Enter the filename when SYMPHONY asks for it

To import the data in LOTUS 1-2-3, proceed as follows:

- Start LOTUS 1-2-3 (see your LOTUS 1-2-3 user manual)
- Select subsequently <F9>, <F>ile, <I>mport and <N>umbers
- Enter the filename as LOTUS 1-2-3 asks for it

To import the data in EXCEL 4.0 for Windows, proceed as follows:

- Start up Windows and EXCEL
- Select FILE and OPEN or press <CTRL> + <F12> keys
- Select drive and directory with the exported Inspector data files
- Select LIST FILE OF TYPE: Text files (*.TXT, *.CSV)
- Select TEXT and use separator 'Comma' if you have selected DSP:0 in the Inspector or use 'Semicolon' if you have selected DSP:1 in the Inspector.

Note: Be aware of the right way of the Windows Configuration Settings.

The data are now imported and can be used.

Rember that you can define the decimal point and data separator with the start up option DPS !!

www.manualsplus.com

1037482